RAMAN EFFECT IN ARSENATES AND HEAT OF DISSOCIATION OF AS-O

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ABSTRACT. The Raman spectra of arsenates in solution have been investigated and the four lines with $\Delta\nu$ equal to 349, 827, 878 and 463 cm.$^{-1}$ have been assigned to the AsO_4 ion. The binding force between As and O has been calculated and then the heat of dissociation has been determined.

INTRODUCTION

After the discovery of the Raman effect, several organic and inorganic substances have been studied with the object of interpreting the frequency shifts in the Raman spectra in terms of their grouping of atoms.

The correlation of the frequency shifts in the inorganic compounds with the groupings of atoms and their characteristic oscillation frequencies was first brought about by the works of Pringsheim, Rosen and Carelli [1] on several inorganic nitrates in solution and the same results were virtually obtained by other investigators. As regards the investigation of salts containing ion of the type XO_4, it was carried out successfully by Krishnamurti, [2] Nishi [3] and others. But a few gaps, however, remain to be filled up, *i.e.*, $AsO^{4''}$ ions do not appear to have been investigated in a rigid way. Ghose and Kar [4] attempted to study a few arsenates in solution without much success.

In the present investigation the author attempts to study the Raman effect of a few arsenates in solution and from the Raman shifts the heat of dissociation of the bond As-O is calculated.

EXPERIMENTAL ARRANGEMENTS

The substances were studied in aqueous solution and they were all of Merck's preparation further purified by recrystallisation. Solution was made with redistilled water and was rendered free from the suspended matter by repeated filtration. The method of illumination was virtually the same as that of Wood. The solution was put in an inner tube placed inside a vertical outer jacket. The whole arrangement was clamped upright and a vertical quartz-mercury lamp was placed alongside, so that the light scattered at right angles, emerged along the axis of the vertical inner tube. The scattered beam was totally reflected by a rectangular